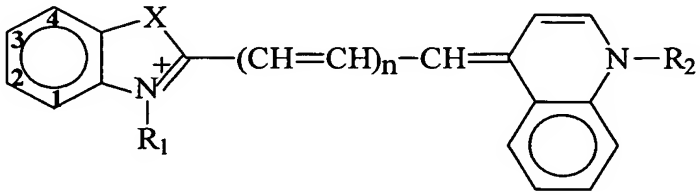
WE CLAIM:

1. An asymmetric cyanine dye compound having the structure



including substituted forms thereof, wherein:

at least one of R_1 and R_2 is linking group; and

X is O, S, or Se;

wherein n ranges from 0 to 2.

2. The compound of **claim 1** wherein a C-3 substituent is nitro.

3. The compound of **claim 1** wherein the linking group is lower alkylamine or lower alkylcarboxy.

4. The compound of **claim 1** wherein one of R_1 or R_2 is $—(CH_2)_nN^+(CH_3)_3$, where n ranges from 2 to 12, and the other is linking group.

5. The compound of **claim 3** wherein the lower alkylcarboxy is $(CH_2)_nN^+(CH_3)_2(CH_2)_nCO_2H$, where n ranges from 2 to 12.

6. The compound of **claim 1** wherein X is sulfur.

7. The compound of **claim 1** wherein n is 0 or 1.

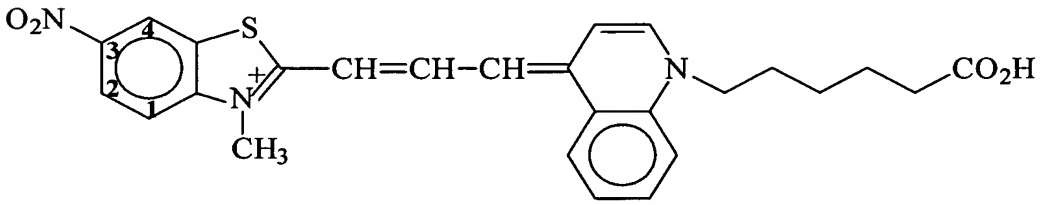
8. The compound of **claim 1** having a fused aromatic or substituted aromatic substituent bonded at positions 1 and 2, positions 2 and 3; and/or positions 3 and 4.

9. The compound of **claim 8** wherein the substituted aromatic includes a nitro substituent.

10. The compound of **claim 1** comprising a bridging group which when taken together with R_2 and the proximate carbon of the methine bridge forms a ring structure having 5 to 7 members.

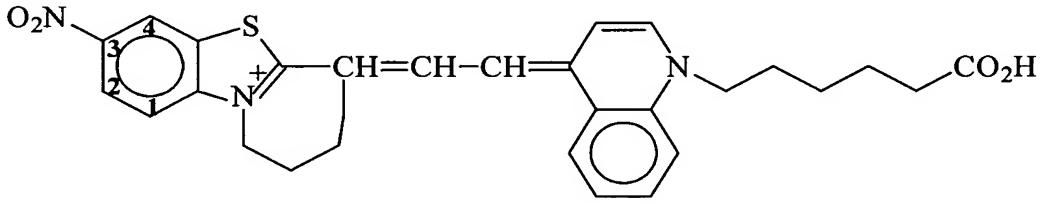
11. The compound of **claim 10** wherein the ring structure has 6 members.

12. The compound of **claim 1** having the structure



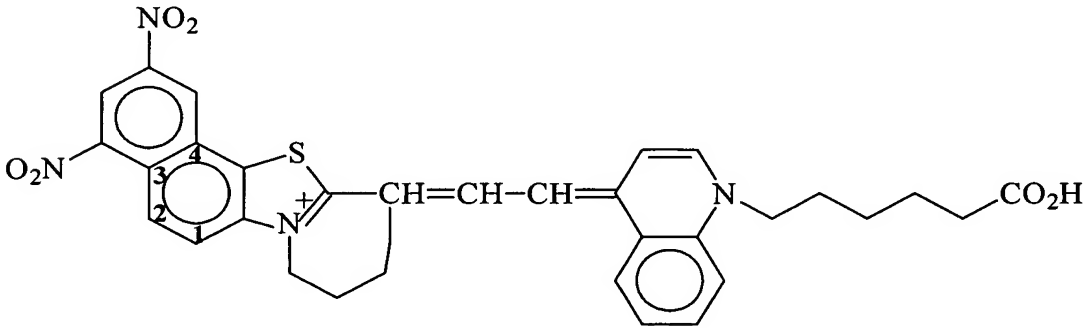
including substituted forms thereof.

13. The compound of **claim 1** having the structure



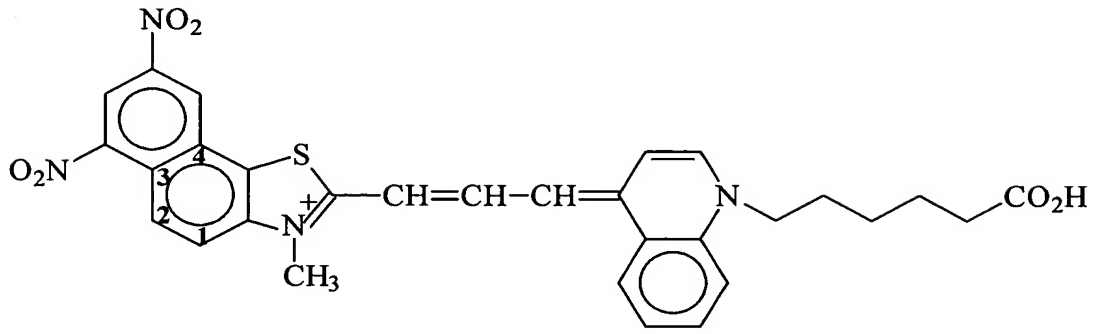
including substituted forms thereof.

14. The compound of **claim 1** having the structure



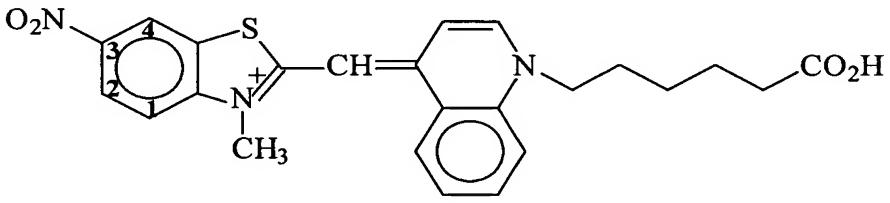
including substituted forms thereof.

15. The compound of **claim 1** having the structure



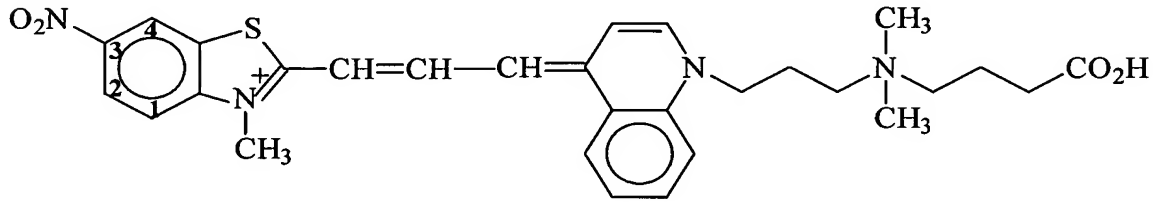
including substituted forms thereof.

16. The compound of **claim 1** having the structure



including substituted forms thereof.

17. The compound of **claim 1** having the structure



including substituted forms thereof.

18. A reporter-quencher energy-transfer dye pair comprising a reporter dye and a quencher dye, wherein the quencher dye is a cyanine dye quencher of **claim 1**.

19. The reporter-quencher energy-transfer dye pair of **claim 18** wherein the reporter is selected from the group consisting of xanthene, coumarin, napthylamine, cyanine, and bodipy dyes.

20. The reporter-quencher energy-transfer dye pair of **claim 19** wherein the reporter is a xanthene dye.

21. The reporter-quencher energy-transfer dye pair of **claim 20** wherein the xanthene dye is selected from the group consisting of fluorescein dyes and rhodamine dyes.

22. A labelled oligonucleotide comprising:

an oligonucleotide; and

a non-fluorescent cyanine dye quencher of **claim 1** covalently attached to the oligonucleotide.

23. The labelled oligonucleotide of **claim 22** further including a reporter dye covalently attached to the oligonucleotide.

24. The labelled oligonucleotide of **claim 23** wherein the location of the reporter dye and the quencher dye is such that when the labelled oligonucleotide is hybridized to a target nucleic acid sequence the reporter dye is not effectively quenched by the quencher dye, and when the labelled oligonucleotide is not hybridized to a target nucleic acid sequence the reporter dye is effectively quenched by the quencher dye.

25. The labelled oligonucleotide of **claim 24** wherein when the reporter dye is effectively quenched its fluorescence is reduced by at least a factor of two as compared to its fluorescence when it is not effectively quenched.

26. The labelled oligonucleotide of **claim 25** wherein when the reporter dye is effectively quenched its fluorescence is reduced by at least a factor of six as compared to its fluorescence when it is not effectively quenched.

27. The labelled oligonucleotide of **claim 23** wherein one of the reporter and quencher dyes is attached at a 3'end of the oligonucleotide and the other is attached at a 5'-end of the oligonucleotide.

28. A method for detecting a target nucleic acid sequence comprising the steps of:

providing a sample nucleic acid including at least one target nucleic acid sequence; and

hybridizing a labelled oligonucleotide probe to the target nucleic acid sequence, the labelled oligonucleotide probe being labelled with an asymmetric cyanine dye compound of **claim 1**.

29. The method of **claim 28** wherein the labelled oligonucleotide includes a reporter dye covalently attached to the oligonucleotide.

30. The method of **claim 29** wherein the location of the reporter dye and the quencher dye is such that when the labelled oligonucleotide is hybridized to a target nucleic acid sequence the reporter dye is not effectively quenched by the quencher dye, and when the labelled oligonucleotide is not hybridized to a target nucleic acid sequence the reporter dye is effectively quenched by the quencher dye.

31. The method of **claim 30** wherein when the reporter dye is effectively quenched its fluorescence is reduced by at least a factor of two as compared to its fluorescence when it is not effectively quenched.

32. The labelled oligonucleotide of **claim 31** wherein when the reporter dye is effectively quenched its fluorescence is reduced by at least a factor of six as compared to its fluorescence when it is not effectively quenched.

33. The labelled oligonucleotide of **claim 29** wherein one of the reporter and quencher dyes is attached at a 3'end of the oligonucleotide and the other is attached at a 5'-end of the oligonucleotide.

34. The method of **claim 29** further comprising the step of digesting the oligonucleotide probe such that one or both of the reporter and quencher dyes is removed from the oligonucleotide probe.

35. The method of **claim 34** wherein the step of digesting the oligonucleotide probe is effected by a 5'→3' nuclease activity of a polymerase enzyme.